

Application No. 10/821,189
Paper Dated March 9, 2006
Reply to Office Action dated Dec. 29, 2005
Attorney Docket No. 116-043810
Response Under 37 CFR § 1.116
Expedited Examining Procedure
Examining Group 2800

REMARKS

Claims 1-4, 9-11, and 15 and 16 stand rejected. (Claims 5-8 and 12-14 are withdrawn.) Claims 1 and 9 have been amended to include the limitation of claim 4 which has been canceled.

The Examiner has rejected claims 9-11 under 35 U.S.C. § 102(b) as anticipated by Hanawa U.S. Patent No. 5,343,149. The limitation originally in claim 4 added now to claim 9 clearly distinguishes the Hanawa reference. Hanawa contains no teaching concerning "applying the total amount of RF power to be almost constant irrespective of whether the RF power of a frequency necessary for measurement of the NMR signal is applied or not applied."

The Examiner's reference to Hanawa, column 4, lines 61-67, is not apt. The sentence cited pertains only to the RF power applied during periods necessary for measurement of the NMR signal. Nothing in Hanawa suggests applying RF power during periods when RF power required for NMR measurement is not being applied and of a frequency not affecting the measurement of the NMR signal.

The Examiner has rejected claims 1-3 and 15 and 16 over Hanawa U.S. Patent No. 5,343,149 in view of Oppelt U.S. Patent No. 4,652,824. The Examiner states:

With respect to claim 1, Hanawa discloses an NMR analysis method comprising the steps of: a) subjecting a sample or specimen to a strong static magnetic field to induce precessional motion to the magnetic moments of atomic nuclei within the sample or specimen (Column 4, lines 28-31); b) applying RF power perpendicularly to the direction of the static magnetic field with an irradiation coil during periods spaced and at an RF frequency to induce precessional motion of the magnetic moments in an excited state (Column 4, lines 1-15); c) detecting an NMR signal released with a detecting coil when precessional motion of the magnetic moments return to a ground state (Column 4, lines 1-15); the improvement comprising: d) during periods complementary to the applying the RF power in step b) applying RF power of a frequency not affecting measurement of the NMR signal to minimize variation in the temperature of the coils detecting the NMR signal (Abstract).

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In addition, Hanawa discloses the claimed invention as stated above except for the step of cooling with low temperature fluids the coils used to apply RF power or detect NMR signals. However, Oppelt discloses the step of cooling with low temperature fluids the coils used to apply RF power or detect NMR signals (Column 3, lines 63-68). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use Oppelt's cooling method with Hanawa's NMR analysis method for the purpose of reducing the noise of the system at the same time that overheating of the coils is avoided.

Reconsideration is respectfully requested.

The Hanawa patent does not teach applying RF power during complementary periods of time nor does it teach applying RF power of a frequency not affecting measurement of the NMR signal. The Examiner makes reference to the abstract of Hanawa. It should be noted that the "RF pulse so as to set a desired flip angle of a spin" is an RF pulse at a frequency that affects measurement of the NMR signal. That is its very purpose. The remaining pulse mentioned in the abstract is the NMR signal itself. This is made clear by the detailed description with reference to Figure 5 at column 5, lines 31-58. RF power is applied during the intervals T1 and T3 only. (These are the 90° and 180° pulses which are pulses affecting the measurement of the NMR.) The NMR signal itself is sensed at T4. No RF pulse is applied during period T2 or during periods not labeled.

Claims 1 and 9 have been amended to include the language of claim 4 which is nowhere suggested in Hanawa or Oppelt. This language further defines the RF power applied during periods when RF power of a frequency necessary for measurement of the NMR signal is not applied.

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The Examiner has objected to the title. The Applicants amended the title in the prior response and believe it is accurate. The Examiner is authorized to change the title further if it is deemed necessary.

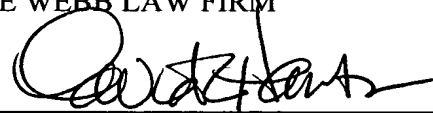
In view of the foregoing amendments and remarks, it is urged that this case is now in condition for allowance.

It is respectfully requested that the amendment be entered for purposes of appeal

Respectfully submitted,

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By



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